

REMARKS

By this Amendment, claims 29, 30, and 33-47 have been amended and claims 31, 32 and 48 have been canceled. Thus, claims 29, 30, and 33-47 are pending in this application. In light of at least the following remarks, Applicants respectfully request reconsideration and allowance of the pending claims.

Applicants appreciate the Office Action's indication that claims 34, 35, 37, 44, and 45 recite allowed subject matter. However, Applicants respectfully submit that all of the pending claims are allowable for at least the following reasons.

I. Title

The Office Action states that the title is not descriptive and requires a new title. The title has been amended to recite the language suggested by the Office Action.

II. Abstract

The Office Action objects to the Abstract citing MPEP §608.01(b). Specifically, the Office Action cites the use of the word "means" as being legal phraseology. The Abstract has been amended in compliance with MPEP §608.01(b). Thus, Applicants respectfully request withdrawal of the objection.

III. Claim Objections

The Office Action objects to claim 46 as containing informalities. Specifically, claim 46 is objected to for containing the word "form." Claim 46 has been amended to recite "from" instead of "form." Thus, Applicants respectfully request withdrawal of the objection.

IV. Claim Rejections Under 35 U.S.C. §103(a)

The Office Action rejects claims 29, 30, 32, 33, 36, 38-43 and 47-48 under 35 U.S.C. §103(a) as unpatentable over Japanese Patent 08-238587 to Soga et al. (hereinafter "Soga"). Applicants respectfully traverse the rejection.

Claim 29 has been amended to include the features present in prior claims 29 and 31 as well as to include the feature of prior claim 48 regarding the direction in which the inert gas is supplied. Similarly, claim 47 has been amended to include the features of prior claims 47 and 48 as well as the gas extraction means of prior claim 31. As prior claim 31 was not rejected solely over Soga, claims 29 and 47 and their dependents are patentable over Soga for the same reasons prior claim 31 was patentable, as well as for the additional features they recite. Thus, the rejection is now moot and Applicants respectfully request withdrawal of the rejection.

The Office Action rejects claims 31 and 46 under 35 U.S.C. §103(a) as unpatentable over Soga in view of German Patent Application Publication DE 3931401 to Gnann. Applicants respectfully traverse the rejection.

As claim 31 is canceled and claim 46 depends from an amended claim, the rejection as to these claims is moot. Applicants respectfully request withdrawal of the rejection.

The amended claims 29, 30, and 33-47 incorporate features included in prior claims 31 and 48. As the Office Action rejected prior claims 31 and 47 over Soga in view of Gnann, Applicants additionally address the patentability of claims 29, 30, and 33-47 over Soga in view of Gnann.

As noted, claim 29 has been amended to incorporate the features of prior claims 29 and 31 and the direction of inner gas supply as recited in claim 48 and claim 47 has been amended to include the features of prior claims 47-48 and gas extraction as in prior claim 31.

The Office Action alleges Soga discloses side nozzle 2 corresponding to the claimed plasma suppression means and that side nozzle 2 delivers gas at an angle θ between 10-70° which impinges on the workpiece a distance x from the weld. The Office Action alleges further that Soga discloses that the spray angle θ must be adjusted depending on various welding parameters.

The Office Action alleges Gnann discloses gas extraction means as element 10 situated opposite plasma suppression means and asserts it would have been obvious to one of ordinary skill in the art at the time of the invention to add element 10 of Gnann to the disclosure of Soga in order to prevent plasma gas particles from soiling the focusing lens.

However, neither Soga nor Gnann discloses a plasma suppression means which supplies gas in the welding direction. That is, both Soga and Gnann disclose directing the plasma suppression gas across the laser beam from the side (Soga even calls the nozzles "side nozzles.") Further, Soga discloses two diametrically positioned side nozzles 2 and does not disclose any gas extraction means. Thus, Soga teaches away from the use of a gas extraction means opposite to plasma suppression means as using a gas suppression means opposite a side nozzle 2 would require one of the side nozzles 2 to be removed. Further, Soga does not disclose focusing of a laser beam through a cover slide.

Gnann is allegedly directed to a transverse gas suppression device and discloses suction tube 11 which removes gas blown through the laser beam to remove plasma particles before soldering the focusing lens. The gas removed by suction tube 11 originates from nozzle tube 4 and is redirected by gas from nozzle top 19 through suction opening 10. Thus, suction tube 11 is the gas extraction means and suction opening 10 participates in supplying the gas to be extracted. Further, suction tube 11 is located a good distance above the weld site. However, Gnann discloses a "suction cap" 14 surrounding nozzle tip 5 for gas removal closer to the weld site. Thus, Gnann teaches away from a device to remove gas coming from the impingement area of a weld situated opposite plasma suppression means as Gnann discloses the use of a suction cap 14 which surrounds the laser beam.

Thus, Soga and Gnann, alone or in combination, at least fail to disclose plasma suppression means impinging gas on the workpiece in the welding direction at an angle of between about 38 and 52°, gas extraction means located adjacent to the laser beam and

diametrically opposed to the plasma suppression means or focusing a laser beam through a cover slide. For at least the foregoing reasons, claims 29, 30, and 33-47 are patentable over Soga and Gnann.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 29-30 and 33-47 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,



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Attachments:

Petition for Extension of Time
Amended Abstract

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